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William H. Ashmead
U.S. National Museum

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CLASSIFICATION OF THE FOSSORIAL, PREDACEOUS AND PARASITIC WASPS, OR THE SUPERFAMILY VESPOIDEA.

BY WILLIAM H. ASHMEAD, A. M., ASSISTANT CURATOR, DIVISION OF INSECTS, U. S. NATIONAL MUSEUM.

(Paper No. 6.—Continued from p. 137.)

FAMILY XXVIII.—Vespidæ.

This family is restricted to the paper-making wasps, all social species living in large communities and having three distinct sexes, female, worker, and male, thus agreeing with the social bees, the *Apidæ* and *Bombidæ*, and with many ants, *Dorylidæ*, *Myrmicidæ*, *Formicidæ*, etc.

In some species, too, like the ants, there appear to be two forms of the worker.

Deceived by their habits, for structurally they are widely separated, Westwood and Packard thought the social wasps were allied to the *Apidæ*, and in their scheme of classification have placed them next to the bees, with which they have nothing in common.

Cresson, Kirby and most late writers seem to have followed them, but in my opinion it is clearly an unnatural position; they have no relationship whatever with the bees, and are a component of this great complex, but with affinities, through some exotic forms, allying them with the next great complex, or the superfamily FORMICOIDEA.

Two very distinct groups, here called subfamilies, have been recognized. They were first correctly indicated by C. G. Thomson, the distinguished Swedish entomologist, who called them tribes.

Table of Subfamilies.

Hind wings entire, *without* an anal lobe, mesepisterna not separated ..... Subfamily I.—Vespinæ.

Hind wings *with* a distinct anal lobe; mesepisterna separated..... Subfamily II.—Polistinæ.

SUBFAMILY I.—Vespinæ.

1874. Vespina, Tribus. Thomson, Skand. Hym., III., p. 6.

The absence of an anal lobe in the hind wings, and the non-separated mesepisternum, distinguish the group. The species, too, are much shorter, more robust, with a decidedly shorter mesonotum.

Paravespa, Radoszkowsky, described in 1886, I do not know, but have incorporated it from the description alone.

Three genera have been recognized, separable as follows:

Table of Genera.

First abdominal segment broadly truncate at base.
Eyes not extending to the base of the mandibles.....2.
Eyes extending to the base of the mandibles, or very nearly.
Third cubital cell along the radius fully as long as along the cubitus.....Vespa, Linné.
(Type V. vulgaris, Linné.)
Third cubital cell along the radius much shorter than along the cubitus .....Paravespa, Radoszkowsky.
(Type P. Komarowii, Radoszk.)
2. Third submarginal cell along the radius longer than along the cubitus, or about twice as long; clypeus longer than wide, sinuate or slightly emarginate anteriorly and semicircularly emarginate at sides anteriorly.....Vespula, Thomson.
(Type Vespa austriaca, Panzer.)

SUBFAMILY II.—Polistinæ.

1874. Polistina, Tribus. Thomson, Skand. Hym., III., p. 6.

In this subfamily the hind wings have an anal lobe, and the mesepisternum is separated.

The genera are numerous, and have reached their greatest development in tropical countries. The group is of great economic importance, as the various genera destroy the more destructive Lepidopterous larvæ.

Table of Genera.

Second cubital cell receiving both recurrent nervures.....2.
Second and third cubital cells each receiving a recurrent nervure.
Second cubital cell petiolate; clypeus terminating in a tooth; mandibles short, acutely dentate at apex ..... Anthreneida, White.
(Type Vespa Sumatræ, Weber.)

2. Abdomen petiolate; mandibles 2–4-dentate; maxillary palpi 5- or 6-jointed.....4.

Abdomen not petiolate.

Abdomen subsessile, the first segment campanulate.....3.

Abdomen sessile, the first segment very small, rounded above, the second very large, occupying most of the surface, the following being more or less retracted; second cubital cell wider than long; scutellum entirely covering the post-scutellum.....Nectarinia, Shuckard.

(Type Brachygastra analis, Perty.)

3. Metathorax smooth or punctate; abdomen rather short, subovate or oval.....Chartergus, Latreille.

(Type Vespa apicalis, Fabr.)

Metathorax transversely striate or aciculate; abdomen long, fusiform, or elongate ovate.....Polistes, Latreille.

(Type Vespa biglumis, Linné.)

4. Front wings with *three* cubital cells .....5.

Front wings with *two* cubital cells.....Paraicaria, Gribodo.

(Type P. bicolor, Gribodo.)

5. Abdomen with the first segment, or petiole, linear, the second segment more or less constricted or petiolate at base.....7.

Abdomen with the first segment, or petiole, clavate or subglobose at apex, the second segment normal, not constricted at base.

Second abdominal segment not especially large, not occupying most of the surface nor covering the third .....6.

Second abdominal segment very large, occupying most of the surface, and covering the third, the terminal segments more or less retracted; mandibles 4-dentate, the inner tooth the smallest; clypeus wider than long, slightly rounded or subtriangular anteriorly, but not dentate.....Icaria, Saussure.

(Type I. artifex, Sauss.)

6. First abdominal segment subcampanulate; body of abdomen conical; prothorax narrowed, not margined above; temples as broad or a little broader than the width of the eyes.....Synœca, Saussure.

(Type Vespa Surinama, Linné.)

First abdominal segment variable, sublinear or clavate; body of abdomen fusiform, clavate or subovate; prothorax short; temples

scarcely so broad as the width of the eyes; mandibles 4-dentate, the teeth subequal; clypeus angulate anteriorly..Polybia, Lepeletier.
(Type Polistes liliacea, Fab.)

7. Body elongate, cylindrical, or fusiform, the abdominal petiole very long; mandibles 3- or 4-dentate.....8.

Body rather short, not elongate, the abdominal petiole not especially long; mandibles bidentate.

Body of abdomen rotund; eyes small, the malar space distinct.....Gyrostoma, Kirby.
(Type Cyclostoma orientalis, Kirby.)

Body of abdomen short-ovate; eyes large, the malar space very small or linear.....Tatua Saussure.
(Type Vespa morio, Fabr.)

8. Body of abdomen fusiform, the second segment pedicellate.....9.

Body of abdomen elongate, cylindrical or nearly, the second segment *not* pedicellate and scarcely longer than the third..Apoica, Lepeletier.
(Type Polistes virginea, Fabr.)

9. Second cubital cell trapezoidal, narrowed above; mandibles 4-dentate.

Clypeus short, angulate anteriorly; maxillary palpi 5-jointed.....Belonogaster, Saussure.
(Type Vespa grisea, Fabr.)

Clypeus anteriorly slightly emarginate and bidentate; maxillary palpi 6-jointed, the last joint the longest.....Mischocyttarus, Saussure.
(Type Zethus labiatus, Fabr.)

Second cubital cell triangular; mandibles 3-dentate; clypeus wider than long, subemarginate at apex; maxillary palpi 6-jointed, the first joint elongate, the last two small.....Paramischocyttarus, Magretti.
(Type P. subtilis, Magretti.)

ERRATA.

In Mr. G. B. King's paper on the "Coccidæ of British North America," in the June number, the following corrections should be made:

Page 159, for Ripersia *basi* read R. *lasii*.

Page 160, for Pulvinaria *brassicæ* read P. *brassiæ*.

Page 160, Aspidiotus Dearnessi, Ontario (London), is from Lake Huron, not London.